

FINAL REPORT

Limited Scope Indoor Air Quality Survey SSMC IV

for

National Oceanic & Atmospheric Administration

June 10th and 11th, 2002

Interagency Agreement #: D8H02CO31200
Task: 9903

September 16, 2002

Prepared by
US Public Health Service
Division of Federal Occupational Health
Bethesda Central Office

Executive Summary

At the request of the National Oceanic & Atmospheric Administration (NOAA), Federal Occupational Health (FOH) collected indoor air quality measurements for temperature, relative humidity, carbon dioxide, carbon monoxide, and airborne fungal throughout Building SSMC-4, located at 1305 East-West Highway, Silver Spring, Maryland. Measurements were taken on June 10th and 11th, 2002 following the methodology described below.

Temperatures throughout the building over the time period measured ranged from 71-76⁰F. Indoor relative humidity ranged from 38-58%.

Current guidelines of the American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE) Standard 55-1995 (Thermal Environmental Conditions for Human Occupancy) recommend temperatures in the range of 68-75⁰F in winter season and 73-79⁰F summer season, along with maintaining 30 - 60% relative humidity. These ranges are based on a 10% dissatisfaction criterion.

Carbon dioxide measurements provide an indicator of available “fresh air” in the space. Current standards describe indoor carbon dioxide levels below 850 ppm (AIHA), or no greater than a 700 ppm differential between outside and inside air concentrations (ASHRAE 62-1999) as generally acceptable. Carbon dioxide measurements throughout the building ranged from 347-759 ppm. Carbon dioxide measured outdoors was 375-395 ppm.

Carbon monoxide measurements recorded ranged from 0-1 ppm. The permissible exposure limit for CO is 50 ppm. The "Industrial Hygienist's Guide to Indoor Air Quality Investigations" published by the American Industrial Hygiene Association, Technical Committee on Indoor Environmental Quality cites < 9 ppm average as acceptable. There were no combustion sources in the building to cause elevated CO, and outdoor measurements were 0 ppm.

With regard to microbial sampling, indoor fungal levels were generally lower than those of outdoors and fungi detected indoors were similar to those detected outdoors.

Introduction

At the request of the National Oceanic & Atmospheric Administration (NOAA), Federal Occupational Health (FOH) performed a limited scope indoor air quality investigation of Building SSMC-4, located at 1305 East-West Highway, Silver Spring, Maryland. The investigation took place on June 10th through 11th, 2002. Evaluation methodologies and results are presented in the following report.

Evaluation Methods

Measurements of temperature, relative humidity, carbon monoxide, and carbon dioxide were taken in eight locations on each floor of the building as indicators of relative indoor air quality using a TSI Q Trak IAQ monitor, model 8550/8551. Each floor was designated into two zones on either side of the elevator lobby. Four measurements were taken in each zone in randomly selected locations on the interior and exterior of the floor.

Air samples for fungal contamination were collected by a culturable method using Andersen N-6 samplers at a flow rate of 28.3 L/min. Indoor Andersen air samples were collected for 3 minutes and outdoor samples were collected for both one and three minutes. Two percent (2 %) malt extract agar (MEA) was used to recover general fungi. All plates were incubated in a 25°C incubator and were examined every other day for up to 10 days to ensure the full recovery of fungi. Fungal identification was based on colony morphology, spores and conidia formation. Total fungal colonies formed on each plate were counted and recorded. Fungal levels in samples were presented as colony forming units (CFUs) per measuring unit.

Standards/Criteria

The IAQ Assessment followed general guidelines specified by the Environmental Protection Agency "Building Air Quality" Guide for Building Owners and Facility Managers, and the "Industrial Hygienist's Guide to Indoor Air Quality Investigations" published by the American Industrial Hygiene Association, Technical Committee on Indoor Environmental Quality.

ASHRAE Standard 55-1995 (Thermal Environmental Conditions for Human Occupancy) recommends temperatures in the range of 68-75°F in winter season and 73-79°F Summer season. These ranges are based on a 10% dissatisfaction criterion. The recommended relative humidity range is 30 - 60%.

Carbon monoxide levels should be 0-2 parts per million (ppm) above ambient, < 9 ppm average. Carbon Dioxide levels should remain < 850 ppm ("Industrial Hygienist's Guide to Indoor Air Quality Investigations" published by the American Industrial Hygiene Association, Technical Committee on Indoor Environmental Quality). ASHRAE 62-1999 recommends indoor carbon dioxide levels no greater than 700 ppm higher than outdoor levels (outdoor levels generally range from 300-500 ppm).

There are no “standards” for building microbial burden. Complaint areas are generally compared with non-complaint areas and outside air.

Results and Conclusions

Temperature, relative humidity, carbon dioxide, and carbon monoxide measurements by location are tabulated in Attachment A.

Microbial results are tabulated in Attachment A and B.

Temperatures throughout the building over the time period measured ranged from 71-76°F. Indoor relative humidity ranged from 38-58%.

Carbon dioxide measurements provide an indicator of available “fresh air” in the space. Current standards describe indoor carbon dioxide levels below 850 ppm (AIHA), or no greater than a 700 ppm differential between outside and inside air concentrations (ASHRAE 62-1999) as generally acceptable. Carbon dioxide measurements throughout the building ranged from 347-759 ppm. Carbon dioxide measured outdoors was 375-395 ppm.

Carbon monoxide measurements recorded ranged from 0-1 ppm. The permissible exposure limit for CO is 50 ppm. The "Industrial Hygienist's Guide to Indoor Air Quality Investigations" published by the American Industrial Hygiene Association, Technical Committee on Indoor Environmental Quality cites < 9 ppm average as acceptable. There were no combustion sources in the building to cause elevated CO, and outdoor measurements were 0 ppm.

With regard to microbial sampling, indoor fungal levels were generally lower than those of outdoors and fungi detected indoors were similar to those detected outdoors.

Recommendations

Based upon this limited scope investigation, DFOH

1. maintains the position that the HVAC system should be routinely maintained and checked to ensure all components are properly operating, and that fresh air is adequately distributed to occupied spaces;
2. recommends routine visual inspections of the building to detect any water intrusion from outdoors or water leaks originating from indoor plumbing .

U.S. Public Health Service, Division of Federal Occupational Health

Indoor Air Quality Survey Report---Q Trak Data Log

for the

National Oceanic and Atmospheric Administration, Silver Spring, MD

Survey Methodology:

This table sample data collected during the National Oceanic & Atmospheric administration (NOAA) Limited Scope Indoor Air Quality survey for SSMC II, III, and IV. The survey was conducted in accordance with NOAA project specifications. Eight sample locations were identified on each floor of Building 2, Building 3, and Building 4. Carbon dioxide, carbon

monoxide, relative humidity, and temperature readings were collected at each location twice a day using a TSI Q Trak IAQ monitor. In addition to the IAQ readings, four of the eight sample locations were selected for airborne fungal sample collection by a culturable method using an Anderson N-6 sampler. Daily outside building air samples were collected

for
comparison.

Data Collected By: John Fuller

Building: 4

Floor: 1

Date Samples:
06/12/02

PERIOD I										PERIOD II								
Sample Site	Outside	Rm	Rm	Security	Rm	Stage	Men's RR	Men's RR	Rm	Outside	Rm	Rm	Security	Rm	Stage W.	Men's RR	Men's RR	Rm
	Building	1W514	1W117	Desk	1W524	W. Side	North	South	1W611	Building	1W514	1W117	Desk	1W524	Side	North	South	1W611
Time	10:00am	11:16am	11:33am	11:51am	12:07pm	12:27pm	12:43pm	12:59pm	1:15pm	2:20pm	3:16pm	3:33pm	3:52pm	4:08pm	4:27pm	4:44pm	5:00pm	5:17pm
Temperature	80	74.2	76.5	75.4	73.4	71.8	73.2	72.4	74.3	85	74.3	76.1	76.1	73.9	71.4	72.7	73.8	75.7
Relative Humidity	54	54.2	54.7	54.7	58.4	55.2	58.7	54.6	52.6	53	56.3	55.3	53.7	55.9	52.4	56.9	56.5	51.7
Carbon Dioxide	392	604	414	584	493	377	372	524	504	395	591	358	542	478	347	388	511	475
Carbon Monoxide	0	0.9	0.9	0.5	0.5	0.9	0.6	0.6	0.5	0	1	1	0.7	0.9	0.9	0.9	0.7	0.7
Air Sample #		1	2	n/a	n/a	n/a	n/a	n/a	n/a		n/a	n/a	3	4	n/a	n/a	n/a	n/a
Results in CFU/m³		71	118	n/a	n/a	n/a	n/a	n/a	n/a		n/a	n/a	106	35	n/a	n/a	n/a	n/a

Notes

Data Collected By: John Fuller

Building: 4

Floor: 2

Date Samples:
06/12/02

PERIOD I										PERIOD II								
Sample Site	Outside	Rm	Rm	Rm	Rm	Rm	Rm	Rm	Rm	Outside	Rm	Rm	Rm	Rm	Rm	Rm	Rm	Rm
	Building	2255	2100	2554	2445	2658	2158	2333	2332	Building	2255	2100	2554	2445	2658	2158	2333	2332
Time	10:00am	10:16am	10:33am	10:52am	11:08am	11:27am	11:45am	12:00pm	12:15pm	2:20pm	2:35pm	2:53pm	3:12pm	3:28pm	3:45pm	4:00pm	4:18pm	4:36pm
Temperature	80	73.4	73.4	73.8	73.2	72.3	72.7	74.8	74.8	85	73.2	72.7	73.2	74.3	72.3	72.3	72.5	74.5
Relative Humidity	54	53.2	54.4	54.9	54.5	54.1	56	56.4	52.9	53	55.6	57.4	55.2	56.4	55.9	56.7	58.2	55
Carbon Dioxide	392	562	631	605	584	562	578	687	604	395	536	540	554	601	544	570	554	531

Carbon Monoxide	0	1	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0	1	0.9	0.9	0.6	0.9	1	0.6	0.9
Air Sample #		1	2	n/a	n/a	n/a	n/a	n/a	n/a		n/a	n/a	3	4	n/a	n/a	n/a	n/a
Results in CFU/m ³		12	24	n/a	n/a	n/a	n/a	n/a	n/a		n/a	n/a	24	<12	n/a	n/a	n/a	n/a

Notes

Data Collected By: John Fuller **Building: 4** **Floor: 3** **Date Samples: 06/12/02**

PERIOD I										PERIOD II								
Sample Site	Outside Building	Rm 3601	Rm 3654	Rm 3332	Rm 3253	Rm 3661	Rm 3435	Rm 3255	Rm 3146	Outside Building	Rm 3601	Rm 3654	Rm 3332	Rm 3253	Rm 3661	Rm 3435	Rm 3255	Rm 3146
Time	10:00am	10:16am	10:33am	10:51am	11:03am	11:23am	11:41am	11:59am	12:15pm	2:20pm	2:15pm	2:31pm	2:48pm	3:05pm	3:20pm	3:40pm	3:56pm	4:11pm
Temperature	80	72.9	72.3	73	73.4	73	71.8	73.2	73.9	85	73.2	73	73.2	73.2	73.2	72.3	73	73.6
Relative Humidity	54	50.3	51.6	48.4	47.8	51.4	48.3	47.3	50.3	53	51.3	50.3	47.6	48.6	50.6	47.3	47.9	49.3
Carbon Dioxide	392	553	561	557	569	576	527	564	585	395	613	564	557	625	547	527	549	841
Carbon Monoxide	0	0.5	0.6	0.6	0.6	0.5	0.6	0.7	0.5	0	0.7	0.8	0.8	0.6	0.9	1	0.9	0.6
Air Sample #		1	2	n/a	n/a	n/a	n/a	n/a	n/a		n/a	n/a	3	4	n/a	n/a	n/a	n/a
Results in CFU/m ³		12	24	n/a	n/a	n/a	n/a	n/a	n/a		n/a	n/a	35	24	n/a	n/a	n/a	n/a

Notes

Data Collected By: John Fuller **Building: 4** **Floor: 4** **Date Samples: 06/11/02**

PERIOD I										PERIOD II								
Sample Site	Outside Building	Rm 4601	Rm 4535	Rm 4348	Rm 4622	Rm 4149	Rm 4432	Rm 4339	Rm 4205	Outside Building	Rm 4601	Rm 4535	Rm 4348	Rm 4622	Rm 4149	Rm 4432	Rm 4339	Rm 4205
Time	10:00am	11:17am	11:35am	11:53am	12:08pm	12:27pm	12:45pm	1:01pm	1:17pm	2:00pm	4:36pm	4:54pm	5:10pm	5:27pm	5:45pm	6:00pm	6:15pm	6:32pm
Temperature	84	76.6	71.4	70.3	70.9	72.3	72.9	73.2	73.8	82	72.7	72.7	73.4	71.8	72.5	72.4	72.7	73.2
Relative Humidity	54	38	46.5	48.7	51.6	51	50	47.4	48.1	53	48.4	48.4	46.4	49.5	48.9	47.7	49.9	47.2
Carbon Dioxide	392	514	496	517	555	530	581	577	606	395	559	536	493	534	503	532	543	493
Carbon Monoxide	0	0.7	0.6	1	1	1	1	1	1	0	1	0.9	0.9	1	0.9	0.9	0.9	0.8
Air Sample #	A	1	2	n/a	n/a	n/a	n/a	n/a	n/a	C	n/a	n/a	3	4	n/a	n/a	n/a	n/a
Results in CFU/m ³	1873	59	82	n/a	n/a	n/a	n/a	n/a	n/a	2120	n/a	n/a	59	71	n/a	n/a	n/a	n/a

Notes

Data Collected By: John Fuller**Building: 4****Floor: 5****Date Samples:
06/11/02**

PERIOD I										PERIOD II								
Sample Site	Outside Building	Rm 5601	Rm 5617	Rm 5328	Rm 5200	Rm 5142	Rm 5653	Rm 5412	Rm 5337	Outside Building	Rm 5601	Rm 5617	Rm 5328	Rm 5200	Rm 5142	Rm 5653	Rm 5412	Rm 5337
Time	10:00am	10:15am	10:31am	10:47am	11:09am	11:28am	11:45am	12:02pm	12:19pm	2:00pm	4:15pm	4:32pm	4:50pm	5:06pm	5:26pm	5:42pm	6:00pm	6:16pm
Temperature	84	73.2	72.3	78.8	75.4	74.1	72.9	73	73.6	82	72.5	75.4	73.4	73.6	73	73.4	72.5	73
Relative Humidity	54	42.2	47.5	48.3	42.4	44.7	45.7	46.7	46.7	53	50	45.5	48.4	48.5	48.7	45.2	46.1	47.7
Carbon Dioxide	392	747	704	764	759	798	752	594	768	395	749	758	765	737	750	743	733	750
Carbon Monoxide	0	0.9	0.9	0.9	0.9	0.8	0.9	1	1	0	1	1	0.8	1	0.9	1	1	0.9
Air Sample #	A	1	2	n/a	n/a	n/a	n/a	n/a	n/a	C	n/a	n/a	3	4	n/a	n/a	n/a	n/a
Results in CFU/m ³	1873	24	24	n/a	n/a	n/a	n/a	n/a	n/a	2120	n/a	n/a	259	82	n/a	n/a	n/a	n/a

Notes

Data Collected By: John Fuller**Building: 4****Floor: 6****Date Samples:
06/11/02**

PERIOD I										PERIOD II								
Sample Site	Outside Building	Rm 6531	Rm 6166	Rm 6328	Rm 6109	Rm 6425	Rm 6221	Rm 6147	Rm 6128	Outside Building	Rm 6531	Rm 6166	Rm 6328	Rm 6109	Rm 6425	Rm 6221	Rm 6147	Rm 6128
Time	10:00am	9:15am	9:32am	9:51am	10:07am	10:27am	10:43am	11:00am	11:15am	2:00pm	3:46pm	4:02pm	4:18pm	4:38pm	4:54pm	5:12pm	5:31pm	5:47pm
Temperature	84	73.8	73.6	73.4	73.6	73.9	73.2	72.9	72.7	82	72.7	72.1	72.7	72	70.9	72.5	72.9	72.1
Relative Humidity	54	49.6	46.5	50.1	47.4	47.7	49.3	46.5	47.5	53	46.7	47.4	47.7	47.1	48.3	48.6	47.2	48.3
Carbon Dioxide	392	678	631	634	658	617	606	616	668	395	651	622	621	621	609	628	663	624
Carbon Monoxide	0	1	0.9	0.9	1	1	1	1	1	0	1	1	1	1	0.9	0.9	0.9	1
Air Sample #	A	n/a	n/a	1	2	n/a	n/a	n/a	n/a	C	3	4	n/a	n/a	n/a	n/a	n/a	n/a
Results in CFU/m ³	1873	n/a	n/a	12	<12	n/a	n/a	n/a	n/a	2120	82	12	n/a	n/a	n/a	n/a	n/a	n/a

Notes

Data Collected By: John Fuller**Building: 4****Floor: 7****Date Samples:
06/10/02**

PERIOD I										PERIOD II								
Sample Site	Outside Building	Rm 4348	Rm 7606	Rm 7256	Rm 7307	Rm 7226	Rm 7153	Rm 7601	Rm 7135	Outside Building	Rm 4348	Rm 7606	Rm 7256	Rm 7307	Rm 7226	Rm 7153	Rm 7601	Rm 7135

Time	8:00am	10:46am	11:02am	11:20am	11:35am	11:52am	12:09pm	12:29pm	12:45pm	2:00pm	3:15pm	3:31pm	3:50pm	4:06pm	4:24pm	4:43pm	5:00pm	5:15pm
Temperature	76	73.4	72.1	71.8	72.7	73.8	72.3	73	73	82	71.6	72.5	72.1	71.1	71.4	74.4	74.5	72.3
Relative Humidity	51	48.3	48.7	49	45.9	46.6	48.9	49.7	48	47	49.1	46.7	47.4	48.1	48	45.8	46.8	48.1
Carbon Dioxide	375	655	647	640	589	639	651	719	650	395	588	616	579	533	611	602	620	649
Carbon Monoxide	0	0.8	0.7	0.6	0.8	0.7	0.7	0.6	0.6	0	0.4	0.5	0.6	0.3	0.1	0.5	0.3	0.3
Air Sample #	B	1	2	n/a	n/a	n/a	n/a	n/a	n/a	D	n/a	n/a	3	4	n/a	n/a	n/a	n/a
Results in CFU/m ³	954	35	47	n/a	n/a	n/a	n/a	n/a	n/a	none	n/a	n/a	12	<12	n/a	n/a	n/a	n/a

Notes

Data Collected By: John Fuller **Building: 4** **Floor: 8** **Date Samples: 06/10/02**

PERIOD I										PERIOD II								
Sample Site	Outside Building	Rm 8601	Rm 8348	Rm 8221	Rm 8110	Rm 8624	Rm 8341	Rm 8520	Rm 8627	Outside Building	Rm 8601	Rm 8348	Rm 8221	Rm 8110	Rm 8624	Rm 8341	Rm 8520	Rm 8627
Time	8:00am	10:16am	10:32am	10:50am	11:06am	11:25am	11:40am	11:55am	12:11pm	2:00pm	1:41pm	1:58pm	2:15pm	2:30pm	2:46pm	3:02pm	3:22pm	3:40pm
Temperature	76	74.3	72.5	73.2	73.4	73	73	73.6	72.5	82	74.5	73.4	73	72	70.7	73	72.5	72.1
Relative Humidity	51	46.3	48.1	47.1	46.9	45.1	47.5	48.3	45.1	47	45.8	47.4	48	48.7	46.5	48.4	48.2	46.8
Carbon Dioxide	375	684	641	611	615	620	619	730	645	395	677	654	650	660	616	687	709	612
Carbon Monoxide	0	0.7	0.5	0.7	0.6	1	0.7	0.8	1	0	0.7	0	0.5	0.4	0.5	0.5	0.5	0.6
Air Sample #	B	1	2	n/a	n/a	n/a	n/a	n/a	n/a	D	n/a	n/a	3	4	n/a	n/a	n/a	n/a
Results in CFU/m ³	954	12	24	n/a	n/a	n/a	n/a	n/a	n/a	none	n/a	n/a	35	12	n/a	n/a	n/a	n/a

Notes

Data Collected By: John Fuller **Building: 4** **Floor: 9** **Date Samples: 06/10/02**

PERIOD I										PERIOD II								
Sample Site	Outside Building	Rm 9415	Rm 9204	Rm 9153	Rm 9612	Rm 9266	Rm 9306	Rm 9404	Rm 9517	Outside Building	Rm 9415	Rm 9204	Rm 9153	Rm 9612	Rm 9266	Rm 9306	Rm 9404	Rm 9517
Time	8:00am	9:16am	9:32am	9:51am	10:06am	10:25am	10:40am	10:56am	11:14am	2:00pm	1:27pm	1:47pm	2:05pm	2:21pm	2:39pm	2:58pm	3:14pm	3:31pm
Temperature	76	73	73.2	72	73.2	73.4	73.2	73.8	73	82	72.9	72.9	72.5	72.9	72.5	72.9	73.2	72.7
Relative Humidity	51	49.3	47.8	47.8	46.7	48.5	48	48	47.7	47	48.5	49.3	51.6	48.2	48.2	48.8	48.5	47.9
Carbon Dioxide	375	632	611	620	607	647	602	624	602	395	646	673	662	639	663	657	718	632
Carbon Monoxide	0	0.6	0.7	0.6	0.9	0.8	0.7	0.7	0.9	0	0.5	0.4	0.6	0.5	0.6	0.5	0.4	0.6
Air Sample #	B	1	2	n/a	n/a	n/a	n/a	n/a	n/a	D	n/a	n/a	3	4	n/a	n/a	n/a	n/a
Results in CFU/m ³	954	24	12	n/a	n/a	n/a	n/a	n/a	n/a	none	n/a	n/a	12	12	n/a	n/a	n/a	n/a

Notes

Data Collected By: John Fuller**Building: 4****Floor: 10****Date Samples:
06/10/02**

PERIOD I										PERIOD II								
Sample Site	Outside Building	Rm 10601	Rm 10166	Rm 10348	Rm 10203	Rm 10153	Rm 10243	Rm 10411	Rm 10619	Outside Building	Rm 10601	Rm 10166	Rm 10348	Rm 10203	Rm 10153	Rm 10243	Rm 10411	Rm 10619
Time	8:00am	9:47am	10:03am	10:21am	10:40am	10:56am	11:14am	11:30am	11:46am	2:00pm	3:16pm	3:32pm	3:49pm	4:05pm	4:21pm	4:40pm	4:57pm	5:13pm
Temperature	76	72.3	72.7	73	72.7	73.2	73.6	72.9	73	82	72.5	72.7	72.7	72.9	72.1	72.9	73	73.2
Relative Humidity	51	48	47.6	47.7	46.8	47.5	45.9	46.8	46.9	47	54.2	59.1	47.4	48.1	48.4	47.7	47.1	48
Carbon Dioxide	375	466	527	554	524	487	456	487	499	395	531	590	581	526	529	530	572	563
Carbon Monoxide	0	0.7	0.9	0.9	0.8	0.7	0.8	0.9	0.8	0	0.9	0.6	0.6	0.6	0.7	0.5	0.4	0.4
Air Sample #	B	1	2	n/a	n/a	n/a	n/a	n/a	n/a	D	n/a	n/a	3	4	n/a	n/a	n/a	n/a
Results in CFU/m ³	954	24	24	n/a	n/a	n/a	n/a	n/a	n/a	none	n/a	n/a	35	<12	n/a	n/a	n/a	n/a

Notes

Data Collected By: John Fuller**Building: 4****Floor: 11****Date Samples:
06/10/02**

PERIOD I										PERIOD II								
Sample Site	Outside Building	Rm 11338	Rm 11434	Rm 11641	Rm 11109	Rm 11255	Rm 11305	Rm 11353	Rm 11523	Outside Building	Rm 11338	Rm 11434	Rm 11641	Rm 11109	Rm 11255	Rm 11305	Rm 11353	Rm 11523
Time	8:00am	10:16am	10:33am	10:51am	11:07am	11:26am	11:44am	12:00pm	12:16pm	2:00pm	3:45pm	4:01pm	4:17pm	4:46pm	5:02pm	5:20pm	5:35pm	6:00pm
Temperature	76	72.3	72.9	72.5	71.9	72.1	71.8	72	73.2	82	71.2	72.3	72.7	71.8	71.6	71.8	72	73.4
Relative Humidity	51	47.6	48.5	46.3	47.2	47.9	48.5	48.1	48	47	48.9	52	47.4	50.1	50	51.2	49.1	48.5
Carbon Dioxide	375	467	562	515	478	466	482	482	517	395	571	658	577	559	677	580	567	584
Carbon Monoxide	0	1	0.9	0.8	0.8	0.9	0.8	0.6	0.5	0	0.8	0.8	0.5	0.6	0.7	0.6	0.5	0.7
Air Sample #	B	1	2	n/a	n/a	n/a	n/a	n/a	n/a	D	n/a	n/a	3	4	n/a	n/a	n/a	n/a
Results in CFU/m ³	954	24	71	n/a	n/a	n/a	n/a	n/a	n/a	none	n/a	n/a	35	<12	n/a	n/a	n/a	n/a

Notes

Data Collected By: John Fuller**Building: 4****Floor: 12****Date Samples:
06/10/02**

PERIOD I										PERIOD II								
Sample Site	Outside Building	Rm 12122	Rm 12601	Rm 12520	Rm 12339	Rm 12424	Rm 12628	Rm 12155	Rm 12227	Outside Building	Rm 12122	Rm 12601	Rm 12520	Rm 12339	Rm 12424	Rm 12628	Rm 12155	Rm 12227
Time	8:00am	9:15am	9:31am	9:47am	10:03am	10:19am	10:34am	10:49am	11:04am	2:00pm	2:25pm	2:42pm	2:57pm	3:13pm	3:30pm	3:45pm	4:02pm	4:28pm
Temperature	76	72.9	73.4	73	73.2	73	73.2	73.2	73.8	82	73.2	73	73	72.5	72.9	73.2	73	72.7

Relative Humidity	51	55	54.2	52.6	53.8	52.4	52.7	54.5	52.9	47	55.3	56.6	54.6	54.7	54.3	54.5	55.5	54
Carbon Dioxide	375	605	471	481	491	520	473	550	520	395	586	555	538	568	578	580	568	633
Carbon Monoxide	0	0.6	0.8	0.6	0.8	0.8	0.8	0.8	0.8	0	0.8	0.7	0.6	0.8	0.7	0.5	0.5	0.6
Air Sample #	B	1	2	n/a	n/a	n/a	n/a	n/a	n/a	D	n/a	n/a	3	4	n/a	n/a	n/a	n/a
Results in CFU/m ³	954	82	71	n/a	n/a	n/a	n/a	n/a	n/a	none	n/a	n/a	<12	47	n/a	n/a	n/a	n/a

Notes

Data Collected By: John Fuller

Building: 4

Floor: 13

Date Samples: 06/10/02

PERIOD I										PERIOD II								
Sample Site	Outside Building	Rm 13141	Rm 13446	Rm 13224	Rm 13265	Rm 13158	Rm 13137	Rm 13403	Rm 13433	Outside Building	Rm 13141	Rm 13446	Rm 13224	Rm 13265	Rm 13158	Rm 13137	Rm 13403	Rm 13433
Time	8:00am	8:15am	8:33am	8:49am	9:05am	9:21am	9:41am	9:57am	10:14am	2:00pm	2:00pm	2:16pm	2:32pm	2:48pm	3:04pm	3:20pm	3:36pm	3:54pm
Temperature	76	72.7	72.9	72.7	71.1	73	73.4	73	73	82	72.7	72.5	72.5	70.5	73	73.2	72.1	74.1
Relative Humidity	51	48.4	49.9	49.6	48.9	48.8	47.5	46.7	46.1	47	46.4	46.7	48.3	47.9	46.4	47.8	47.2	45.6
Carbon Dioxide	375	469	520	472	470	469	544	500	478	395	545	557	563	562	553	599	552	554
Carbon Monoxide	0	0.5	0.1	0.7	0	0.5	0.5	0.8	1	0	0.7	0.9	0.8	0.8	0.8	0.4	0.8	0.7
Air Sample #	B	1	2	n/a	n/a	n/a	n/a	n/a	n/a	D	n/a	n/a	3	4	n/a	n/a	n/a	n/a
Results in CFU/m ³	954	<12	71	n/a	n/a	n/a	n/a	n/a	n/a	none	n/a	n/a	59	71	n/a	n/a	n/a	n/a

Notes